

**REMARKS**

Applicant respectfully requests reconsideration of the present application in view of the above amendments and the following remarks.

New claims 27 and 28 have been added. Claims 1, 2, 11, 19 and 20 have been amended; claims 12-18 were withdrawn by the Examiner. Claims 1-11 and 19-28 are presented for further prosecution on their merits.

**I. STATUS OF APPLICATION**

On May 15, 2003, the Applicant and the undersigned attorney for Applicant traveled to the Patent and Trademark Office and interviewed Examiner Kathryn Odland nee Ferko and her supervisor, Mr. Henry Bennett.

The Applicant and the undersigned attorney wish to thank Examiner Odland and Supervisory Examiner Bennett for their time and consideration extended in the aforementioned interview.

The Office Action of November 4, 2002, was made final; however, the Final Office Action did not provide a basis for rejecting claims 10 and 11. During the aforementioned interview, Examiners Odland and Bennett agreed to withdraw the finality of the Office Action dated November 4, 2002.

The outstanding Office Action dated March 30, 2004, withdrew the finality of the Office Action dated November 4, 2002.

**II. SUMMARY OF OFFICE ACTION**

The Examiner has rejected claims 1-6, 20 and 21 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 460,054 to Rhind.

The Examiner rejected claims 7-11, 19 and 22-26 under 35 U.S.C. § 102(a) as being unpatentable over U.S. Patent No. 460,054 to Rhind.

**III. DISCLOSURE OF U.S. PATENT NO. 460,054 TO RHIND**

U.S. Patent No. 460,054 discloses a gas burner that includes three radial gas-supply arms 3 that have ducts in their center and connect to a ring 3a having a circular channel which communicate with the ducts of the arms, an annular chamber 4 formed from a cylindrical outer wall 6 and a cylindrical inner wall 7. (Rhind sometimes refers to elements 6 and 7 as walls and at other times refers to them as tubes.) The cylindrical walls 6, 7 have a top 5a provided with perforations or jet-apertures 5. (See Rhind lines 35-50.) The gas burner disclosed in the '054 patent also includes an inner shell 9, an outer perforated shell 10, a conically-shaped outer perforated thimble 12 that is fixed to a concentric ring 13, an inner perforated thimble 14, and an air distributor consisting of a perforated hanging shell 16 and a centrifugal disk deflector 17. An additional annular shell 18 defines annular chamber 15.

**IV. TRAVERSAL OF ART REJECTIONS SET FORTH IN OFFICE ACTION****DATED MARCH 30, 2004**

In the aforementioned interview and in the outstanding Office Action, the Examiner raises the issue regarding the nature/meaning of the word "proximate."

The Examiner believes that Applicant's use of the term "proximate" makes the claims unusually broad.

Applicant respectfully submits that the Examiner has overlooked other language in Applicant's claims that limit the term "proximate" and define a precise location for the base of each conical frustum 82, 80. However, as a result of the interview and in the interest of moving the prosecution of this application forward, Applicant has deleted the word "proximate" from independent claims 1 and 20. Applicant expressly locates the base of the first frustum section adjacent to the gas exit holes in a radially inward direction and locates the base of the second frustum section adjacent to the gas exit holes in a radially outward direction.

The Examiner and Applicant agree that Rhind's jet-apertures 5 serve the same general purpose as Applicant's gas exit holes 74. Applicant's amended claims 1 and 20 place the first and second frustum sections on the burner tube adjacent to the gas exit holes (the first frustum section radially inward and the second frustum section radially outward). Applicant believes that the amended claims 1 and 20 exactly locate the positions of the first and second frustum sections.

A rejection under 35 U.S.C. §102(b) requires that each and every element of the claimed invention be taught by the cited reference(s). Since a patent must describe and enable an invention to one skilled in the art, an anticipatory patent by definition must place the claimed invention into the public domain. Clearly, U.S. Patent No. 460,054 to Rhind fails to disclose each and every element of the claimed invention as amended and therefore cannot anticipate Applicant's invention.

Rhind's combustion system requires at least eight major aperture elements, including a top 5a, an inner shell 9, an outer perforated shell 10, a conically-shaped outer perforated thimble 12, an inner perforated thimble 14, a perforated hanging shell 16, a centrifugal disk deflector 17, and an additional annular shell 18.

Applicant utilizes two air-controlling conical frusta 82, 80. In independent claims 1 and 20, Applicant clearly and expressly recites two frusta conical sections. The difference between Rhind's eight (at least) air-controlling elements and Applicant's two elements would traverse any rejection based on Section 102. Rhind does not describe nor does it enable the claimed invention, and therefore cannot anticipate Claims 1-11 and 19-28 of Applicant.

As the Examiner knows, the prior art must be considered in its entirety. Rhind's complexity (i.e., at least eight major air-directing elements plus an annular gas chamber) teaches directly away from Applicant's simple, yet highly effective, design. Accordingly, Rhind cannot make obvious Applicant's claims 1-11 and 19-28.

Rhind discloses an annular gas-chamber 4 formed between walls 6 and 7. (See Rhind, lines 51-54.) This annular gas chamber 4 is somehow connected to ring 3a which in turn is connected to arms 3.

In contrast to Applicant's claimed invention, Rhind does not disclose a burner tube. As discussed below, Rhind requires a high-profile annular chamber, which is unlike the low-profile tube utilized by Applicant. Rhind requires a deep annular chamber (made from walls 6 and 7) in order to position the jet-apertures 5 at a specific height with respect to other elements in the Rhind burner. Applicant does not have this structural limitation. Therefore, Rhind cannot anticipate Applicant's claimed invention. Moreover, Applicant's two frusta conical sections are

both positioned “above” the gas exit holes and project in the same general direction as the direction in which gas leaves the gas exit holes (i.e., Applicant has no important structural elements “below” the burner tube). Since Rhind’s structure requires elements both “above” and “below” the jet-apertures 5, it teaches directly away from Applicant’s structure and therefore cannot make obvious Applicant’s claimed invention.

Even if the Examiner insists that the (high-profile) annular gas-chamber 4 is analogous to Applicant’s (low-profile) burner tube, there are no frustum sections and, in fact, no element whatsoever connected to the annular chamber 4 of Rhind adjacent to the jet-apertures 5 that project in the direction in which the gas generally exits the jet-aperture 5 as claimed by Applicant.

Whereas Applicant expressly locates the base of two frustum sections adjacent to the gas exit holes. The jet-apertures 5 of Rhind are located mid-way along the burner system’s length or about half-way up with respect to perforated thimble 14, and outer perforated thimble 12; completely “above” upper shell 9, outer perforated shell 10 and additional annular shell 18; and completely “below” perforated hanging shell 16. In other words, if Applicant’s burner tube is considered to be a reference plane, all of Applicant’s claimed elements are located above the gas exit holes on one side of the plane. In contrast, if the top 5a of the annular chamber 4 is considered a reference plane, Rhind has several elements above the plane, several elements below the plane, and the plane “bisects” several elements (that is, some elements are located both above and below the plane). Therefore, Rhind neither discloses nor suggests Applicant’s claimed invention as set forth in independent claims 1 and 20, or any claim that depends directly or indirectly from them (2-11 and 21-28).

It is important to note that the basal end of the first conical frustum section is attached to the burner tube adjacent to, but radially INWARD from, the gas exit holes. Similarly, the basal end of the second conical frustum section is attached to the burner tube adjacent to, but radially OUTWARD from, the gas exit holes. Based on the location expressly set forth in Applicant's independent claims 1 and 20, the frusta straddle the gas exit holes.

In contrast, Rhind's upper shell 9 is attached to the top 5a at a position radially outward from the jet-apertures 5, but there is no element that is attached to the top 5a at a position radially inward from the jet-apertures. Again, since Rhind does not teach or suggest the attachment of an air-controlling element attached at a point adjacent to, and radially inward from, the jet-apertures, it cannot make obvious Applicant's amended claims 1 and 20 or any claim that depends therefrom.

Of the aforementioned eight elements, Rhind discloses three spherically-shaped aperture elements, two flat aperture elements, one conical aperture element and two conical frustum-shaped aperture elements. Rhind's conical aperture element (i.e., inner perforated thimble 14) and the conical frustum-shaped element (i.e., outer perforated thimble 12) both converge in the same direction above the jet-apertures 5 (i.e., they narrow as the distance from the jet-apertures 5 increases); also, thimble 14 and thimble 12 both diverge in the same direction below the jet apertures. In contrast, Applicant's claimed invention discloses that one frustum section converges and the other frustum section diverges as the radial distance from the burner tube increases.

As stated previously, perforated thimble 14 converges above the jet-apertures 5 and diverges below jet-apertures 5 as does outer perforated thimble 12. Applicant has no air-

controlling elements “below” the gas exit holes. These structural differences disclosed in Rhind are completely dissimilar to Applicant’s claimed invention and teach directly away from Applicant’s structure so that Rhind cannot make obvious Applicant’s independent claims 1 and 20.

With respect to claim 20, the Examiner states, “Rhind also discloses a second conical frustum (such as 9 and 10 and associated components).” The Examiner has failed to note that:

- A) upper shell 9 and outer shell 10 both are located radially outward with respect to the jet-apertures 5;
- B) both inner shell 9 and outer shell 10 diverge as their distance increases from the top 5a; and
- C) both inner shell 9 and outer shell 10 are located “below” the jet-apertures 5 in a direction that is substantially opposite to the direction in which the gas would exit jet-apertures 5.

Although the basal end of inner shell 9 does appear to attach to the top 5a (and diverges from there), it is unclear exactly where the basal end of outer shell 10 begins. Based on the description, basal end 10 appears to be attached to the distal end of inner shell 9 in order to form chamber 8, and is NOT attached to top 5a. (See Rhind at lines 55-59.) Therefore, if the Examiner is trying to make the comparison that Rhind’s inner shell 9 is analogous to Applicant’s second frustum section that is attached in a radially outward direction with respect to the gas exit holes, the comparison fails because inner shell 9 does not extend generally in a direction in which the gas would exit the jet-apertures (i.e., “above” the top 5a), and there is no similar

element that corresponds to Applicant's first frustum section attached adjacent to the jet-apertures 5 at a position radially inward from the jet-apertures 5.

Applicants amended claims 1 and 20 position both frustum sections "in the general direction in which the gas would exit said gas exit holes," i.e., "above" the gas exit holes. Further, one of Applicant's frustum sections diverge while the other converges, and one is located radially inward from the gas exit holes while the other is located radically outward . No where does Rhind disclose or suggest that elements are attached to the top 5a of the annular chamber 4, BOTH radially inward and radially outward with respect to the jet-apertures 5.

In contrast, Applicant's first conical frustum 82 converges inward as the distance from the burner tube increases, while the second conical frustum 80 diverges as the distance from the burner increases. The only "diverging" conical "frustum" disclosed by Rhind are below the jet apertures 5. Rhind does not disclose or suggest a diverging conical frustum above the top 5a in the direction in which the gas would exit. Accordingly, Rhind not only fails to anticipate Applicant's claimed structure, it fails to suggest Applicant's claimed structure; therefore, Rhind cannot make obvious Applicant's Claims 1-11 and 19-28.

Despite the Examiner's characterizations of Rhind's shells and thimbles as frusta sections, Rhind's inner perforated thimble 14, outer perforated thimble 12, inner shell 9, outer shell 10, hanging shell 16 etc. all disclose that the perforations on each element are the same size. (That is not to say that perforations on outer shell 10 have a different diameter than perforations on perforated thimble 12 or different from perforations on other elements.) In contrast, Applicant teaches the use of different sized perforations on the SAME element. Therefore, Rhind cannot anticipate or make obvious Applicant's claims 8, 10, 27 and 28.



In view of the above, Applicant respectfully requests that the Examiner withdraw all art rejections based on Rhind.

**V. CONCLUSION**

Rhind does not disclose or suggest Applicant's two conical frusta sections for controlling the air flow in a combustion system. More importantly, Applicant's claims 1 and 20 precisely locate the base of the frustum sections on the burner tube adjacent to the gas holes (one radially inward and one radially outward with respect to the gas exit holes) and both frustum sections extend away in the same general direction that the gas leaves the gas exit holes.

Rhind neither discloses nor suggests a diverging conical frustum section in the general direction in which the gas exits the jet apertures and, in fact, Rhind teaches directly away from Applicant's claimed structure by requiring elements both above and below the jet-apertures. Therefore, Rhind can neither anticipate nor make obvious Applicant's claims 1-11 and 19-28.

Moreover, Rhind teaches that the perforations on each air-controlling element are the same size. In contrast, Applicant teaches the use of different sized perforations on the SAME element. Therefore, Rhind particularly cannot anticipate or make obvious Applicant's claims 8, 10, 27 and 28.

Applicant respectfully requests reconsideration of this application in view of the above

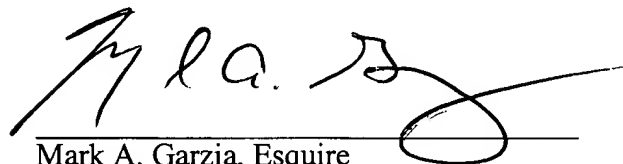
amendments and remarks, and the prompt issuance of a Notice of Allowance for claims 1-11 and 19-28.

Respectfully submitted,

Daniel P. Topp

Date: 30 AUGUST 2004

Enclosures



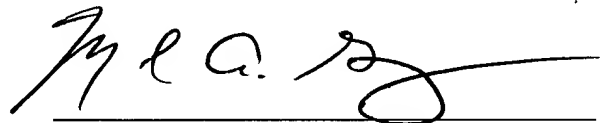
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**CERTIFICATE OF MAILING**

I hereby certify that this Reply to Office Action and Amendment, along with any paper or fee indicated as being enclosed, is being deposited with the United States Postal Service as First Class Mail, postage prepaid, and addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

Date: 30 AUGUST 2004



Mark A. Garzia